

Contractual PPPs for Transport Infrastructure in Spain: Lessons from the Economic Recession

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ABSTRACT *In this paper, we analyse the successes and failures of contractual public-private partnerships (PPPs) for delivering and operating transport infrastructure in Spain from the award of the first toll highway concession programme to the present. To that end, we show the risk allocation principles used in Spain and explore the evolution of the contracting approaches over the years. We found that the performance was reasonably good until the arrival of the economic crisis in 2008. Taking advantage of that, we make a review of contractual PPPs for different transport modes and assess the impact that the economic crisis has had on their business performance and the capacity of the central and regional governments to fulfil their commitments with the private sector. This analysis enabled us to identify measures that, if had been applied, would have improved the resilience of these contract during the economic crisis.*

1. Introduction

The literature acknowledges that delivering infrastructures through public-private partnerships (PPPs) schemes may provide important benefits to the public by increasing efficiency through the smart allocation of risks (Saussier, 2013). However, implementing a PPP approach successfully is not straightforward due to the complexity of the contractual agreements as well as the uncertainty stemming from long contractual periods (Kwak, Chih, & Ibbs, 2009). Moreover, dealing with PPPs is not an easy task due to the large disciplines involved in it such as economics, accounting, law or engineering, to name but a few (Hodge, Greve, & Boardman, 2010). In order to minimize these difficulties, Domingues and Zlatkovic (2015) demand stronger governance institutions which help avoid opportunistic behaviour from private consortia. Moreover, Ruuska and Teigland (2009) suggest the implementation of mechanism for problem resolution among stakeholders.

According to the Green Paper on PPPs of the European Commission (2004), PPPs can be classified into two categories: contractual and institutionalized PPPs. In contractual PPPs, the partnership between the public and the private

sector is based solely on contractual links, whereas in institutionalized PPPs, the public and private sectors are partners of the same corporation. The best-known model regarding contractual PPPs is the concessive model, which is characterized by the direct link between the private partner and the final user. "The private partner provides a service to the public, in place of, though under the control of, the public partner" (Commission of the European Communities, 2004). In this approach, the remuneration for the contractor will consist of charges levied to the users that may be supplemented by subsidies from the public authorities. Other type of contractual PPP is the private finance initiative (PFI) model where the remuneration for the private sector does not take form of charges paid by the users, but of regular payments by the public partner.

As Institutionalized PPPs are negligible in Spain, this paper focuses on contractual PPPs, particularly concession contracts, which have a long tradition in the Spanish legal framework. Infrastructure concessions in Spain were awarded to private consortia through competitive bids (Medda, Carbonaro, & Davis, 2013). Concessions in Spain have been characterized by the allocation of considerable risk — demand, acquisition of the right of way and financial risks — to the private sector in the contracts, but also by important termination guarantees by the government. Notwithstanding the importance of concession contracts in Spain, this paper includes also new PFI kind of contracts such as shadow toll and availability payment approaches that have been put into effect in Spain over the last few years.

After joining the European Union in 1986, Spain experienced steady economic growth that enabled the country to grow at a higher pace than other European countries. During this period, the government of Spain opted for major investments in public infrastructure by taking advantage of several types of approaches. Most of the contractual PPPs awarded in Spain have been toll highway concessions. However, in the last few years, there has been a great increase in the number of other kind of approaches, such as shadow toll or availability payment contracts. Contractual PPPs have also been used to build and operate other type of infrastructure such as urban rail systems, hospitals, prisons, etc. The recession, as is well known, has had very negative consequences for Spain's economy. The gross domestic product (GDP) per capita plummeted and the unemployment rate increased from 9% to 26% of the working population in just four years. The crisis has also had severe consequences for the economic performance of infrastructure concessions. Traffic levels declined at a much greater rate than did the GDP. In addition to that, the conditions imposed by the financial markets on borrowers became much stricter because of the liquidity crisis. Furthermore, the government experienced severe budgetary constraints to comply with its commitments with shadow toll and availability payment contracts.

The objective of this paper is twofold. First, we characterize the main features of contractual PPPs in Spain and describe its evolution over the years. And second, we explain and assess the impact of the economic recession on the performance of contractual PPPs for transport infrastructure in Spain, particularly highway concessions. Apart from this introduction, this research is divided into four additional sections. In Section 2, we describe the evolution and characteristics of contractual PPPs in Spain. In Section 3, we point out the importance that contractual PPPs have had to boost different types of transport infrastructure in Spain. In Section 4, we analyse the consequences of the economic crisis on the performance of the contracts for both private investors and the governments who own the infrastruc-

ture assets. From this analysis, we obtain crucial lessons about decision-making process, contract design, risk allocation and public guarantees, which are provided in Section 5.

2. Contractual PPPs in Spain: Evolution and Characteristics

2.1. *Brief History*

Concession contracts have a long history in Spain (Acerete, Shaoul, & Stafford, 2009). In fact, the first railway lines built in the country during the nineteenth century were constructed, financed and operated by private companies through concessions agreements with the government. Taking advantage of this long experience, the Spanish companies have enjoyed competitive advantages in the international toll road industry in the last two decades (Carpintero, 2011).

The concession model was adopted again by the government in the mid-1960s to undertake an ambitious highway programme. Between 1967 and 1975, 2042 km. of toll highways were granted by the central government of Spain on the basis of toll highway concessions. There were two reasons for the Spanish government's decision to start a toll highway programme as a means of expanding and improving the Spanish highway network. First, the economic growth that Spain experienced during those years prompted a great rise in traffic, which suddenly made better highways come to be regarded as a necessity. Second, the state budget in Spain was not able to afford such a huge investment, so private funding was the only means available to reach that goal (Vassallo, Ortega, & Baeza, 2012a).

In order to attract funding from financial institutions and other investors for such projects, the government decided to add certain fiscal advantages and financial guarantees to highway concession contracts. The main ones were tax breaks, loan guarantees and exchange insurance provided by the State for those loans denominated in foreign currency. The two petroleum crises that the industrialized countries experienced in the 1970s had a huge impact on the guarantees provided by the Spanish government to highway concessionaires. On the one hand, the rise in gas prices caused traffic growth to be lower than expected. On the other hand, exchange rates became substantially unstable. These factors triggered the guarantees that had been incorporated in the already existing contracts, which ultimately became very expensive for the government. Nevertheless, highway concessions achieved the goal of providing the country with a modern highway network at a time when the public budget of Spain was not sufficient to afford such a huge cost (Izquierdo & Vassallo, 2004). According to the international performance review conducted by Hodge and Greve (2007), this could be considered as another example of contradictory evidence of PPPs effectiveness around the world.

From 1975 to 1995, few highway concessions were awarded because the socialist government, which took office in 1982 and remained in power until 1996, was politically opposed to promoting private concessions as a means to finance highways. Instead, the government opted for widening and upgrading the most important roads, turning them into dual-roadway fast lanes — called *autovías* in Spanish. This new programme was completely funded by the public sector, which constituted a significant burden for the Spanish government. However, after joining the European Union, the socialist government decided to adopt the concession model to deliver new transport infrastructure. The reason for this change was the need to

tackle the investment of new infrastructure under the budgetary constraints imposed by the European Commission.

In 1996, the new conservative government of the People's Party, which was in office to 2004, faced the need to contain Spain's public deficit to join the Euro. This was the main reason why the new government decided to implement once again the policy of using concessions so as to encourage the participation of the private sector in the financing of new transportation infrastructure. In 2003, the People's Party government passed a new contractual PPP Law that was applicable to every kind of infrastructure promoted not only by the central government, but also by regional and local governments. From then on, contractual PPPs have been extensively used as a means to manage and finance different types of infrastructure such as: roads, urban rail systems, intermodal exchange stations and other type of public facilities. This trend has been maintained with the following governments. However, the arrival of the crisis in Spain in 2008 substantially weakened the financial feasibility of these projects.

2.2. *Legal Framework*

The legal framework of concession contracts and PPPs in Spain has evolved significantly throughout the years (Baeza & Vassallo, 2010). The first concessions were awarded on the basis of specific decrees passed by the government. In 1972, a new law was passed. Its purpose was the regulation of toll highway concession contracts and public guarantees applicable to them. As we noted before, the main ones were tax breaks, loan guarantees and, for those loans denominated in foreign currency, exchange insurance provided by the State.

However, the most important legal development referred to PPPs in Spain occurred with the approval of the contractual PPP law in 2003, which introduced many mechanisms for sharing risks between private sponsors and the government. The objectives of this law were, among others, to extend the applicability of contractual PPPs to every type of public works, to reinforce the contribution of private financing for constructing and maintaining public facilities, and to define a new risk-sharing approach. This law permitted the application of the shadow toll and availability payment approaches, which had not hitherto been allowed. Moreover, this law considerably restricted some of the public guarantees approved by previous legislation, even though it incorporated several mechanisms whereby the public sector could eventually contribute to the financial feasibility of concession contracts.

In 2007, a new public contracts law was passed in Spain in order to transpose new EU Directives to the Spanish legal framework. This new law basically maintained the legal framework for contractual PPPs set up in 2003, but established a new contractual model that was named "contract for the collaboration between the public and the private sector". This new contractual model was envisaged as especially appropriate for extraordinarily complex undertakings involving construction of new facilities with the management of complex operation activities related to the infrastructure. The Law imposed that this new contract had to be procured using the competitive dialogue approach. In addition, it required a 'value for money' analysis for this new type of contract. Other contractual PPP approaches such as concessions, shadow toll and availability payment models continued to be utilized without a previous 'value for money' analysis.

In 2011, a new public contracts law was passed in order to gather and interconnect all the loose legislation pieces existing in this area. This law included the regulation of funding sources for PPPs. The main ones are the possibility of issuing securities, the possibility of mortgaging concessions as a guarantee for the lenders, and finally, the implementation of subordinated loans.

One of the most controversial clauses of the Spanish law is the one that sets up the compensation to the concessionaire in case of early termination of the contract. This clause, which is called RPA (*Responsabilidad Patrimonial de la Administración* in Spanish), establishes that if the contract terminates earlier, the government will have to pay a compensation to the contracts for the works that have been built and have not yet depreciated. This compensation will be equal to the capital cost declared by the contractor in its financial plan minus the depreciation of the assets calculated according to the accounting norms of Spain. Regardless of the principle under which this guarantee is based, the fact is that this guarantee may have serious consequences for the government since the committed payments will immediately increase the size of the public deficit of Spain (Vassallo, Baeza, & Ortega, 2012). In fact, we will see later that this clause became very problematic for the government once the economic recession came in to Spain.

2.3. *Main Features of Contractual PPPs in Spain*

Contractual PPPs in Spain have mostly retained their distinctive features throughout the years, even though there are still some differences between the early highway concessions awarded in the late 1960s, and the new PPP contracts — both concessions and other approaches — awarded in the last few years.

Procurement of contractual PPPs for infrastructure in Spain has been done largely on the basis of an 'open procedure'. Unlike other long-term infrastructure contracts in the world — that is, design build finance operate contracts in the UK, and most of the PPP contracts in Germany — (Shaoul, Stafford, & Stapleton, 2006; Tang, Shen, & Cheng, 2010), contractual PPPs in Spain are hardly ever awarded by means of the negotiated procedure.

This open procedure means that any company that fulfils the minimum requirements set out by the government in the tender provisions is allowed to participate in the process. The government chooses the winner in terms of a set of criteria — both economic and technical — according to which the offers presented by different bidders are qualified. Contracts are not negotiated in this approach since the government submits standard contracts to the bidders along with the bidding terms. PPP contracts in Spain are consequently rather incomplete since they are not negotiated for each project (Krüger, 2012). This fact may explain why renegotiation is so common in Spain (Baeza & Vassallo, 2010).

Sánchez and Gago (2010) prove that the transaction costs of the open procedure, for both bidders and the government, are much lower than those of the negotiated procedure. These low transaction costs are likely the most important reason why the number of participants in the tendering processes in Spain is often quite large (Vassallo & Sánchez, 2007). However, most of the participants are well-known Spanish firms since the lack of publicity and transparency of the tendering and awarding processes in Spain creates strong barriers that prevent foreign companies to compete fairly. Public access to the information could improve the governance and accountability of PPPs (Shaoul, Stafford, & Stapleton, 2012), and therefore remove those barriers. Similar lessons are obtained from Steijn, Klijn,

and Edelenbos (2011), who recommend greater attention to the managerial efforts to develop and implement PPPs.

Another feature of concession tenders in Spain is that, although bidders are demanded to submit a business plan in their offers, they are not required to reach a financial close before the contract is awarded. This feature constitutes an important difference compared to other countries (Carmona, 2010). An interesting innovation introduced in Spain is the so-called 'progress clause' that consists of requiring the concessionaire to maintain and operate the public works according to the technical, environmental and safety regulations that are currently in force and applicable. The aim of this clause is to guarantee that the concessionaire is going to adequately maintain and operate the highway throughout the years. Ever since the implementation of this clause in 2003, the technological risk has been transferred to the private sector.

Regarding risk allocation, the current law establishes that the private sector should be allocated most of the market risks. However, this law allows rebalancing the economics of the contract in three circumstances (Vassallo & Gallego, 2005):

- First, when the government imposes additional changes to the original contract terms so as to favor the public interest — that is, additional works required of the concessionaire to improve safety on the highways.
- Second, when the government carries out actions not foreseen when the contract was signed, which substantially affects the economics of the contract — that is, a change in the corporate tax rate, or the construction of a competing infrastructure not originally foreseen.
- Third, when circumstances of force majeure (e.g. damages caused by war) lead directly to substantial disruption of the financial terms of the concession.

In addition to this, the Spanish law allows, but does not require, the contracting parties to set up a procedure to mitigate demand risk in concession by setting up a minimum and maximum threshold in the terms of any variable related to the financial result — users, revenues, and so on — of the concession, as defined in the bidding terms. Unfortunately, this measure has rarely been adopted in the original contracts at the beginning of the concession period, although it is included in the law.

Table 1 shows how risks are usually allocated in concession contracts in Spain compared to the recommendations included in the report "Transport Infrastructure Investment: Options for Efficiency" published by the OECD/ITF (2008). From this table, it is clear how risk allocation in Spain turns out to be more inclined towards the private sector than the recommendations put forth by the OECD, even though this is just a generalization since specific risk mitigation mechanisms can be found across different projects.

Although contracts in Spain seem to allocate a big amount of risk on the contractor's side, it is right that in the end, some of those risks are not assumed in practice by the private sector due to the frequent renegotiations that take place over the life of the PPP contract. For instance, Cabrera and Suárez-Alemán (2014) show how the government of Catalonia assumed the shortage of revenues of the C-16 road concession; and, at the same time, extended the concession period from 35 to 50 years.

Table 1. Risk allocation in transport infrastructure concessions in Spain compared to the recommendations from the OECD

Risk category	Example	Risk allocation in Spain	Partner likely well suited to manage the risk ^a
Force majeure	Loss from war and natural disasters	Change in the economic balance of the contract	Public
Regulatory/ political risk	Project delays, changes in law/ policy affecting revenue	Change in the economic balance of the contract	Public
Revenue/ demand risk	Land acquisition Deficient revenue due to low traffic volume or lower price due to demand elasticity	Private ^b Private In some cases shared with the government	Mostly public — some private
Design/technical risk	Engineering or design failures	Private	Private
Construction risk	Cost escalation due to delay or faulty techniques	Private In some cases renegotiated with the government	Private
Operating risk	Costly operation and life cycle maintenance	Private	Private
Environmental risk	Damage and liability/mitigation costs from adverse environmental events	Private	Private
Financial risk	Cost of inadequate revenue hedging and debt management	Private ^c Subordinated public participation loans	Mostly private — Some public
Project default risk	Project bankruptcy from any/all of the factors above	Mostly public	Shared public/ private

^aRecommendations from the OECD. *Source:* Vassallo, Ortega, and Baeza (2012b).

^bFor this risk, there are examples in Spain where mitigation mechanisms have been implemented.

^cIn case of early termination, financial risks are partly covered by the termination guarantee called RPA.

3. The Role of Contractual PPPs in Promoting Infrastructure Investment in Spain

Spain made a big effort to increase and improve its infrastructure capital stock from 2000 to 2009. Several reasons explain this trend. First, there were significant synergies that contributed to the boom of Spain's economy during this period (Fandel, Giese, & Mohn, 2012). This fact increased the budgetary resources available for financing infrastructure. Second, the European Union provided a lot of funding to Spain for building new infrastructure in order to facilitate its economic convergence with other European countries. Third, Spain made use of different types of contractual PPPs to raise resources from the private sector to fund infrastructure. And fourth, there was a huge political support to promote new infrastructure.

Figure 1 shows the evolution of public fixed investment in Spain compared to the EU-16 (the 16 first countries to join the European Union, which were basically the most developed ones). The general government fixed investment includes every kind of public investment, such as roads, rails, hospitals or civil buildings, to name but a few. This figure shows that Spain invested much more than the average of the EU-16 for a long period of time. The value of this rate in Spain



Figure 1. General Government fixed investment (as a % of GDP) in Spain and EU-16.
Source: Own compilation with data from Eurostat.

increased relentlessly until reaching 4.5% of the GDP in 2009. However, from 2009 on, the effect of the economic recession prompted a substantial reduction of public capital expenditure. In fact, 2012 was the first year in the last decade where the General Government fixed investment in Spain was below the average of EU-16. This trend continued in 2013.

Focusing just on transport infrastructure investment (road, rail, airports and ports), its level was dramatically reduced from €22 416 million in 2009 to €12 473 million in 2012. This meant a fall from 2.14% to 1.21% of Spain's GDP. Most of the capital expenditure in the last few years was allocated to the construction of high-speed rail infrastructure. Figure 2 graph a shows the steady increase of the rail infrastructure investment share compared to other modes. In fact, since 2010, more than the 45% of the total investment has been devoted to rail infrastructure.

Contractual PPPs — mostly concession, but also other approaches — substantially contributed to the development of infrastructure and other kind of public facilities in Spain. Figure 2 compares the public transport investment carried out in Spain split into different modes (Graph 2(a)) with the investment procured in transport infrastructure every year (Graph 2(b)). Annual values for the two graphs do not have to coincide necessarily since the investment procured in a certain year will be carried out over several following years.

From 2003 to 2012, both the central and the regional governments procured contractual PPPs for transport infrastructure, totalling on average €3986 million a year, which meant approximately 22.5% of the public investment in transport infrastructure in Spain. Figure 2(b) shows the evolution of the infrastructure concession procurement share over the years that fluctuated between 3.0% and 48.5% of the total public transport infrastructure investment in Spain. We observe that there was an increase in the percentage of investment procured through contractual PPPs from 2009 to 2011 when the economic crisis had already arrived in Spain. In these years, contractual PPPs represented on average 36% of the total investment procured in transport infrastructure in the country. This figure proves that the government tends to rely more on PPPs when public expenditure cuts are

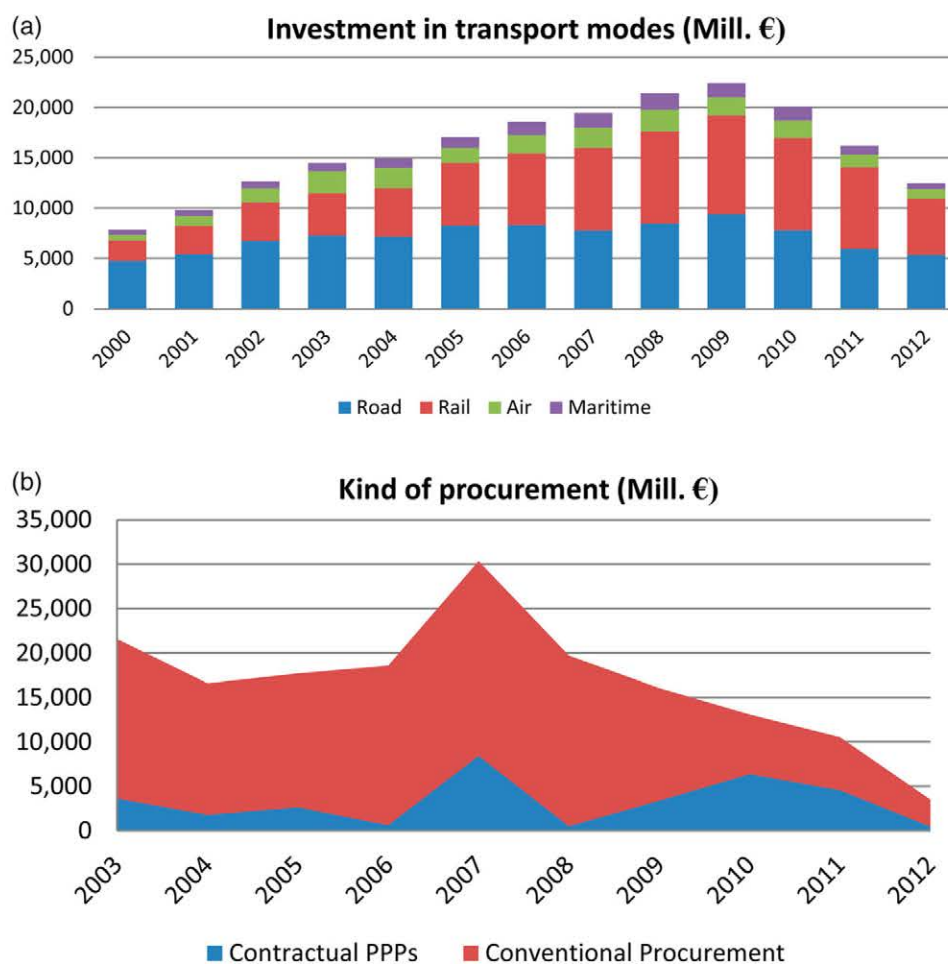


Figure 2. Public investment in transport infrastructure in Spain.

Source: Own compilation with data from Ministerio de Fomento and SEOPAN.

required to reduce the public deficit. Nevertheless, as a consequence of the requirements demanded by financial institutions and the worsening of the economic situation, in 2012, the transport infrastructure procured under the contractual PPP approach was negligible. However, it is important to note that 2012 was not only hard for PPPs in Spain, but it was actually the year in which PPP volume was the lowest in Europe (EPEC, 2013).

Looking at the administrative level, we noticed that regional governments were the ones who used contractual PPPs the most. From 2003 to 2012, they procured more than 60% of the PPP investment volume in Spain. The central government procured 21.75% and local governments 17.5%. The Central government used the PPPs model mostly for roads, while regional governments did it for different kinds of infrastructure.

Table 2 shows the investment volume procured under contractual PPP approaches in Spain from 2003 to 2012 sorted by type of infrastructure facility. It is noteworthy how the share of road projects, both Greenfield and Brownfield (72.71%), was the largest among all types of infrastructure. In the period of analysis, €20 658.9 and €8329.9 million were tendered to undertake Greenfield and Brownfield road projects, respectively. Contractual PPPs have also been extensively used for delivering urban transport facilities such as intermodal exchange stations, trams, parking and light rail systems. The investment amount in this type of infrastructure totalled €7634.8 million.

Table 2. Transport infrastructure investment volume procured through contractual PPPs in Spain from 2003 to 2012 (million €)

Kind of infrastructure		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total	%
Ports		100.1		292.4	7.5			56.73	139.29	106.73	20	722.75	1.81
Roads	Greenfield	2321.1	259.3	1632.8	417.3	2723.9	481.1	3316	6218.4	3289		20 658.9	51.82
	Brownfield		1513.4	697.5		5689.4					430	8329.9	20.89
Railway		1068.9								1151.4		2220.3	5.57
Airports		113.8			185.2							299	0.75
Urban Transport		407.5	182.6	615.7	1228.7	449.2	2687.3	225.1	1664	46.3	128.4	7634.8	19.15
<i>Total</i>		4011.4	1955.3	3238.4	1838.7	8862.5	3168.4	3597.83	8021.69	4593.43	578.4	39 865.65	100.00

Source: SEOPAN.

4. Effect of the Crisis on Contractual PPPs in Spain

4.1. The Economic Crisis

Figure 3 shows the evolution over time of the real GDP growth rate in Spain compared to the EU-16. It is worth noting that for many years, Spain experienced a sustained GDP growth above the average of the EU-16. Despite the good performance of Spain until 2007, things became much worse after 2008. It can be appreciated how the recession struck Spain much more sharply than the EU-16 in terms of reduction of GDP growth, particularly in years 2010, 2011 and 2012. Moreover, the unemployment rate increased at a much faster pace in Spain (from 9% in January 2008 to more than 26% in December 2012) than in the EU-16 (from 7.4% to 11.9% in the same period).

The economic recession also impacted the business performance of transport infrastructure PPPs in Spain in two ways. First, concessions and shadow toll contracts — particularly toll highways with good alternatives to the users — endured a substantial reduction of real traffic levels compared to the expected levels occurred. Second, there was a substantial tightening of the requirements demanded by financial institutions to provide loans.

Moreover, the crisis also had negative consequences for the government insofar as many of the contracts became close to bankruptcy and, as mentioned earlier, the government had established a guarantee in case of earlier termination of the contract (Sierra, Vassallo, & Baeza, 2014).

4.2. Business Performance for the Private Sector

4.2.1. *Toll Highway Concessions.* From 1996 to 2012, 835 km of new toll highways were awarded by the central government of Spain through the concession approach. Toll highway concessions in Spain had always been Greenfield projects (Baeza & Vassallo, 2012). The impact of the economic crisis on toll highway concessions was enormous. Toll highways in Spain have always a rival route, the

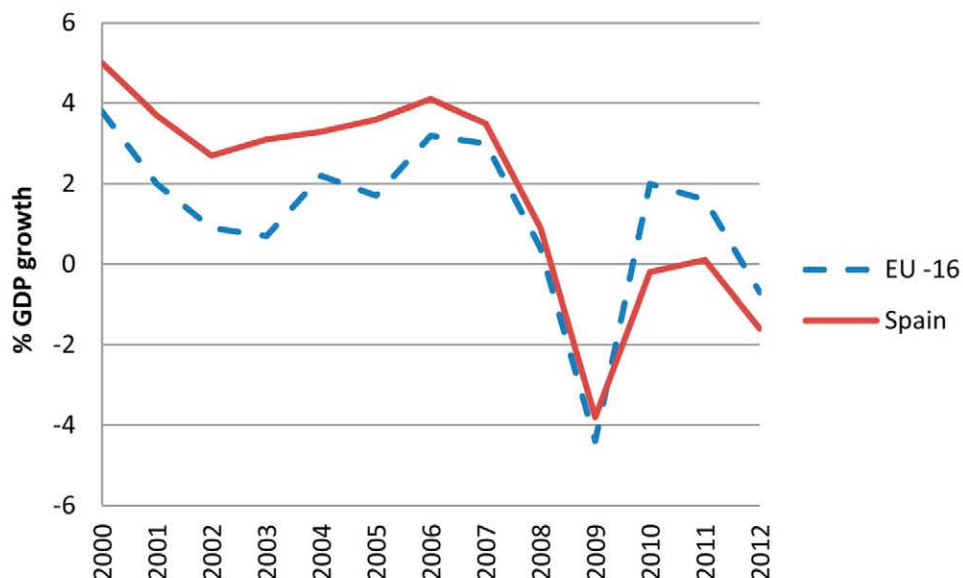


Figure 3. Real GDP growth rate on Spain and EU-16.

Source: Own compilation with data from Eurostat.

free alternative serving the same corridor, in such a way that the users of highways have the option to choose between a toll highway that offers them better quality and shorter travel time, and a free alternative — often a conventional single road and in some cases, a free highway — which offers them lower quality and longer travel times, but it is free. While the economy was doing well, the users tended to be more prone to using the toll highways than their free alternatives. However, the income decline prompted by the economic recession caused both a traffic reduction and a diversion of traffic to free alternatives. This effect has had a great impact on the business performance of toll highways in Spain (Vassallo et al., 2012a).

Table 3 shows the annual average daily traffic (AADT) and traffic deviations with respect to the original forecasts conducted by the concessionaires for the toll highways awarded by the central government of Spain from 2003 to 2012. This table helps to realize a couple of important points. First, most of the concessions ended up having very low traffic levels, which would have never justified the construction of a new highway. Hernando and Romana (2010) recommend building a highway instead of a conventional road when the expected AADT is higher than 14 000 vehicles a day. This fact proves that the decision to develop the new toll highways did not make much sense from the social point of view. The second point is that the traffic estimates made by the government were extremely optimistic. These two points show that the planning process in Spain at that time was not that good.

This situation has implied a continuous deterioration of the business performance of these toll highways (Baeza & Vassallo, 2014). The Return on Equity (ROE), which measures the efficiency of a firm at generating profits from each unit of shareholder equity, ended up being negative for many of the concessions. For instance, the ROE of the Madrid–Toledo highway became negative, with very poor figures in 2009 (−22.36%), 2010 (−7.25%) and 2011 (−29.65%).

The impact of the recession was particularly negative for the toll highways built in the metropolitan area of Madrid. In this case, the negative effects of the crisis were reinforced by the lack of the right planning and the haste of the government in the procurement process. Vassallo et al. (2012) showed several reasons why the planning process was unwise and hurried: (1) in case that a cost benefit analysis (CBA) for these projects were conducted, it was never published; (2) the toll highway accesses to Madrid compete for traffic with a parallel free highway that has a very good quality and little congestion; (3) an additional lane was added to each of these free roads just few years after the toll highway started their operation; (4) the government did not conduct a sensitivity analysis of the traffic volume in the toll road to the evolution of the economy and the addition of lanes in the free alternative; and (5) the toll and free highways were not easily connected to each other and little information was provided to the users about the congestion in the free alternative.

Most of the toll concessions awarded in Spain from 1996 on had to tackle the economic recession just at the ramp-up period when the greatest traffic growths were expected (Bain, 2009). To make things even worse, some of the toll concessions awarded in Spain just before the crisis had not reached their financial close when the recession came in, so they ended up bearing much greater financial costs than expected. In addition, because of a controversial decision of the Supreme Court, expropriation costs of the toll highway concessions close to urban areas ended up being much higher than expected. The simultaneous com-

Table 3. Traffic evolution in the toll highways awarded in Spain from 2003 to 2012

Toll motorway concession	First year of operation	Traffic AADT and traffic deviations	Year									
			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Santiago-Alto de Santo Domingo	2003	AADT	3614	4546	4437	4833	5483	5683	5865	6159	5785	4967
		Deviation	−43%	−33%	−34%	−32%	−26%	−26%	−26%	−24%	−33%	−48%
Segovia-El Espinar	2003	AADT	4763	4768	5014	5544	6177	5966	6297	6556	6472	6288
		Deviation	−28%	−31%	−30%	−25%	−19%	−25%	N.A.	N.A.	N.A.	N.A.
León-Astorga	2003	AADT	4271	3749	3944	4270	5123	5347	5152	5357	4745	4017
		Deviation	−28%	−44%	−46%	−45%	−37%	−37%	−41%	−35%	−45%	−55%
R-2 Madrid — Guadalajara	2003	AADT	5003	6180	7675	9502	11 034	10 594	9378	9278	7801	5928
		Deviation	−63%	−58%	−58%	−47%	−43%	−48%	−54%	−61%	−67%	−75%
R-3 Madrid — Arganda	2004	AADT		10 724	13 499	16 136	16 230	15 193	14 842	14 073	12 387	10 309
		Deviation		−57%	−47%	−41%	−44%	−51%	−59%	N.A.	N.A.	N.A.
R-5 Madrid — Navalcarnero	2004	AADT		6943	7922	10 208	11 864	11 309	10 836	10 535	9475	8028
		Deviation		−58%	−55%	−47%	−43%	−50%	−50%	−52%	−60%	−71%
R-4 Madrid — Ocaña	2004	AADT		6348	6665	9150	11 347	10 402	8835	8096	6675	5489
		Deviation		−56%	−57%	−45%	−36%	−45%	−56%	N.A.	N.A.	N.A.
Eje aeropuerto	2005	AADT			10 227	18 552	20 296	20 134	19 609	19 395	18 336	18 298
		Deviation			−79%	−65%	−61%	−65%	−71%	N.A.	N.A.	N.A.
Ocaña-La Roda	2006	AADT				4194	4646	4770	4471	4003	3715	3015
		Deviation				−49%	−55%	−56%	N.A.	N.A.	N.A.	N.A.
Madrid–Toledo	2007	AADT					2736	2861	2364	1974	1828	1424
		Deviation					−82%	−74%	−83%	−90%	N.A.	N.A.
Cartagena-Vera	2007	AADT					3179	3285	3174	3288	3142	2820
		Deviation					−70%	−65%	N.A.	N.A.	N.A.	N.A.
Circunvalación de Alicante	2008	AADT						9990	7985	7256	6533	5715
		Deviation						−40%	−37%	−55%	N.A.	N.A.
Alto de las Pedrizas — Málaga	2012	AADT										8192
		Deviation										N.A.

Source: Analysis of the authors with data obtained from Ministerio de Fomento.

bination of all these effects caused that some concessions were not able to fulfil their commitments with the lenders. Consequently, at the beginning of 2015, they went literally bankrupt.

4.2.2. *Shadow toll and Availability Payment.* In 2006, the central government of Spain launched a programme to upgrade, rehabilitate, maintain and operate already existing infrastructure (Brownfield projects) through an approach that combined both shadow toll and availability payment mechanisms. The objective of these contracts was to make stricter the design standards of the first free expressways (*autovía*) built in the early 1980s and, at the same time, to enhance the quality of their maintenance and operation during the contract period. In fact, in 2007, the Central Government tendered PPP contracts accounting for more than €5700 million. Regional governments in their turn used the shadow toll and availability payment approaches to procure Greenfield roads. The reason why these approaches boomed in Spain in the last decade was the intention of governments to avoid investment to be accounted upfront as public deficit according to the standards of the EU (Baeza & Vassallo, 2010).

The business performance of shadow toll and availability payment contracts was not as poor as toll highways for the private sector. On the one hand, these roads were not charged and therefore their traffic flows were not so sensitive to GDP fluctuations as toll highways were. On the other hand, in these contracts, the revenue did not rely solely on traffic but also on performance-based standards such as availability and quality of service. These kinds of indicators are extremely useful to measure the outcome of the concession and therefore evaluate their performance (Koontz & Thomas, 2012). For instance, according to official data, the traffic reduction experienced by these PPP contracts between 2008 and 2012 was close to 11%, whereas traffic reduction in toll roads lay between 20% and 60%.

4.2.3. *Other Transport Infrastructure.* Apart from roads, contractual PPPs have been used in Spain for other type of transport infrastructure. The most remarkable projects have been those related to urban mobility, such as trams, light metro systems and intermodal exchange stations. All these facilities have been developed mostly by regional governments and municipalities since they are in-charge of urban transportation.

The regional government of Madrid has used the contractual PPP approach to procure intermodal exchange stations that consist of a subterranean building, made up of several stories, to facilitate the modal transfer of commuters arriving from the suburbs in metropolitan buses to both the subway and urban bus networks. Some of them connect also to the commuter rail network, and some others are designed to receive interregional coaches as well. These stations were considered initially a successful experience because they helped commuters to save travel time, bus companies diminished their costs of operation, abutters gained in quality of life, private operators of the infrastructure made a fair profit and finally the government was able to promote these infrastructure facilities without spending more of its scarce budgetary resources (Vassallo, Di Ciommo, & García, 2012). However, the economic recessions reduced the number of users, and increased the financial cost of the debt. As a consequence of the crisis, some of the contracts were renegotiated through the incorporation *ex post* of minimum revenue guarantees that were ultimately covered by the public budget.

Many regional governments of Spain have also promoted trams and light metro systems awarded through PPP approaches in the main cities of Spain (Sastre, 2009). Most of these projects were not financially feasible on the sole basis of the tariffs paid by the users, so governments subsidized them either through an upfront lump sum or a subsidy to the tariffs. The economic recession is impacting the profitability of these projects because the ultimate transport demand was in the end lower than the original estimates.

Some of these projects, such as the metro in Seville or Malaga, experienced huge deviations in construction and operation costs. Line 1 of the Seville's Metro entered into operation 21 months later than expected; and construction and operation costs ended up being 75.8% higher than the original budget. As a consequence of this, the Regional Government of Andalucia had to contribute with additional €1095 million. The deviations in the case of the Malaga's Metro were even worse. The delay in lines 1 and 2 was 65 months. Cost deviations were 112.8% higher. The additional cost for the Regional Government was € 1391 million (Cámara de Cuentas de Andalucía, 2014).

Other examples of lack of demand and cost deviations are the tram projects in two middle-sized cities of Spain: Parla and Jaen. The mayor of Parla, a municipality with 120 000 inhabitants located in the Region of Madrid, inaugurated a tram in 2007, just before the economic crisis came in. Construction costs ended up being 37.96% higher than expected, and the service was almost cancelled in 2011 due to the financial problems of the city to pay the annual subsidy to the private company that operated the tram. Thanks to the bail-out of the Regional Transport Authority of the Region of Madrid, the service was not finally disrupted, but Parla has to face an important increase of its debt due to delays in the annual payments as well as construction cost deviations.

Jaen is a city with 115 000 inhabitants and their tram was announced before the local elections in 2007. The works started in April 2009 and finished in May 2011. After a few years of operation, the company went bankrupt because of lack of demand. As of the end of 2014, the situation was even worse: the tram did not work for 42 months, and the investment rose up to €120 million. This is an example of how to construct a tram, increase the debt of the city and give it little use.

4.3. Consequences for the Public Sector

The economic recession was also problematic for the governments that own the infrastructure assets for three reasons. First, because some of the contracts — the ones based on shadow toll and availability payment approaches — committed long-term budgetary resources for a long period of time. Second, because these contracts included public guarantees that were ultimately triggered because of the economic recession. And third, because the eventual bankruptcy of concession contracts would force the government to get the assets back and find new ways to manage and operate them.

As we showed earlier in this paper, some infrastructure investment decisions in Spain in the last decade — for both PPP and conventional procurement approaches — have been motivated by political reasons (de Rus & Roman, 2006); and de Rus, 2012). As a consequence of this, CBA were hardly ever conducted. This situation was admitted by the Transport Infrastructure Plan (PITVI) approved by the People's Party (Ministerio de Fomento, 2013). In fact,

this plan proposes to change the former planning practices and use again economic tools, such as CBA, on the basis of which infrastructure investment decisions should be adopted.

In the context described above, the central and regional governments of Spain used the shadow toll and availability payment approaches to inaugurate new infrastructure — in many cases, not justified from the socioeconomic point of view — with the goal of moving the public deficit forward in time. In short, these approaches were mostly used by the Spanish governments to maintain a high investment pace while public deficit remained untouched in the short term. However, shadow tolls and availability payments create future obligations for the governments that commit their budgets over the years. The media also criticized the lack of rigorous analysis and studies to construct the shadow toll highways during the economic boom.¹

The recession implied serious deficit cuts that reduced the budget allocated to different policies while concession commitments were still there. This situation is causing important issues to regional governments because they are bearing serious problems to comply with their obligations with private operators. Some PPP contracts that were awarded by regional governments, such as Aragon, at the outset of the economic crisis were ultimately terminated because the government was not able to guarantee the payments in the future. Other regional governments such as Catalonia and Madrid have been thinking about turning shadow toll concession into real toll ones, even though they finally declined to do it due to the high degree of opposition from users.

In addition to the previous problem, some governments of Spain, especially the Central government, is undergoing serious problems coming from the likely bankruptcy of toll highway concession contracts. As we explained earlier in this paper, the government would be substantially harmed if highway concessions ultimately go bankrupt and the contracts have to be terminated because, according to the Spanish law, in case of early termination, the government has to pay to the concessionaire the non-depreciated capital cost originally invested. This clause — called RPA — will result in a high cost for the government just when the economy is performing worst; the government has scarce budgetary resources, and it is submitted to a strict control of its public deficit. This situation pushed the government to adopt measures to help the concessionaires to improve the viability of their businesses just to avoid paying them as a consequence of bankruptcy.

In this respect, the Central government approved a set of measures in order to mitigate the effects of the recession and the large cost overruns in the acquisition of the right of way experienced by some concessionaires. One of the measures adopted by the government was the award of subordinated public participation loans (SPPLs) to the concessionaires, which the concessionaires will have to pay back to the government in the future (Vassallo & Sánchez, 2007).

However, the economic prospects of the concessions were so poor that the award of SPPLs alone was not enough to make the projects viable. In order to solve this problem, the government changed the contract terms of two of the concessions. The Radial 2 concession — a suburban toll highway that was created to alleviate congestion in getting into and out of Madrid City — was extended by 14 years and the tolls allowed to be charged by the concessionaire were increased above the levels originally established in the contract (Villalba-Romero & Liyanage, 2014). The holder of the concession, which included both Radial 3 and Radial 5 — also suburban toll highways in the metropolitan area of

Madrid — was also authorized to raise the tolls over the values originally set up in the contract terms (Ortega, Baeza, & Vassallo, 2011).

The aim of changing the original contract terms was to guarantee that the project will be able to pay back the SPPLs provided by the government. This measure has been implemented as well in the Alicante — Cartagena highway concession. The contract term of the concession Málaga — Alto de Las Pedrizas, has also been changed by the government through a 17-month extension of the concession's duration. Moreover, tolls were raised above what was originally established in the contract.

In addition, at the end of 2010, the Parliament approved a law to guarantee to the concessionaires that were not performing well the difference between the 80% of the revenues originally expected and the revenues actually collected for a period of three years. The revenues of most of the toll concessions hover around 50 and 70% of the original estimates. However, the funds provided by the government are supposed to be paid back to the government with an interest rate equivalent to the SPPLs.

In 2011, the government disbursed up to €80.1 million to compensate 9 concessionaires because of the lack of traffic. These are basically the concessions whose operations began in 2004 or later, and consequently have been particularly harmed by the drop in traffic following the recession.

Despite this set of measures, in order to avoid the use of the RPA clause, since 2013, the government is negotiating with the concessionaires the implementation of a new state-owned company whose aim would be to manage and operate the nine concessions that went literally bankrupt. The banks and construction companies of the concessionaires would receive Spanish treasury bonds to be paid in a long period of time (30 years), but should accept a debt relief. This solution would increase the Spanish debt but not the deficit. However, due to the different interests of the government and other stakeholders, mainly foreign banks, by early 2015, the negotiations had not been finished yet.

5. Conclusions and Recommendations

Contractual PPPs, especially concessions, have allowed Spain to develop and upgrade a lot of different kinds of infrastructure, especially highways. Moreover, Spain has developed a successful PPP industry (infrastructure developers, construction companies and banks), which is nowadays very active all over the world. PPPs performed reasonably well in Spain until the arrival of the economic turmoil. However, the economic crisis that started in 2008 has put concessions and other PPP approaches in Spain under stress. This fact enabled us to identify some lessons to improve the performance of these contracts in the future.

A first lesson is that the primary reason to use PPPs should have never been to circumvent budgetary constraints, but rather to promote efficiency in the provision of public works. This paper showed how the governments of Spain, particularly from 2000 to 2012, used contractual PPPs to develop infrastructure whose social feasibility was, at least, doubtful. Tools such as CBA and value for money were scarcely used to evaluate the feasibility of the projects. As a matter of fact, the new infrastructure plan launched in 2013 has introduced the requirement of introducing a CBA for the appraisal of all the road projects.

A second lesson, which is related to the previous one, is that a good planning process is a crucial driver for the success of PPPs. Projects should make sense

and address social needs. A good planning process would reduce the risks for the public and the private sector.

A third lesson is that the risk allocation approach in Spanish PPP contracts does not seem to be the most adequate. On the one hand, risks that are hardly manageable, such as the acquisition of the right of way, are initially allocated to the private sector. On the other hand, the numerous renegotiations of PPPs in Spain provoke that many risks end up being paid by the society.

A fourth lesson that the case of Spain brings about is the fact that the government often prefers to renegotiate rather than terminate earlier the contracts. This is because the early termination of the contract may cause several problems for the government: (a) it may cause disruption in the public services; (b) it may result in larger transaction costs for the government; and (c) in the particular case of Spain, it can trigger public guarantees that result in a high cost for the government.

A fifth lesson is that budgetary commitments to the future might turn out to be unviable if a recession eventually arrives. A solution for this problem might be to set up a clear limit to the budgetary commitments associated to PPPs.

A final lesson is that the RPA guarantee defined by the Spanish Law does not transfer the right incentives to the bidders in the tender. As the government is obliged to pay in case of bankruptcy, it barely has any incentive to allow the concession to go bankrupt. Thus, the government will almost always prefer to renegotiate and mitigate risks in order to avoid the termination of the contract. If the bidders understand this, they will likely make very aggressive offers to win the contract at all costs under the expectation of renegotiating the contract in the future. As a consequence of this, the procurement mechanism itself will be undermined.

The case of Spain shows how the renegotiation of concession contracts may result in negative consequences for the users who, in the end, have to pay more through the rise of the toll rates or the extension of the concession terms. In order to avoid this kind of renegotiation, the government must devote whatever time is necessary to arrive at accurate estimates and to draft contracts of the highest quality, that cover all eventualities. In addition, it would be of interest to study the creation of an independent regulator or watchdog to defend the interests of users and taxpayers in the renegotiations of the contracts.

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No potential conflict of interest was reported by the authors.

Note

1. <http://www.elconfidencial.com/espana/2012/05/20/quien-se-lleva-el-dinero-de-los-peajes-de-aguirre-las-concesionarias-en-el-punto-de-mira-98244>.

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